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Applicant(s): Keegan, et al.

Docket No.

89190.072901/DP-304631

Application No.

10/032,606

Filing Date

October 19, 2001

Examiner

R. Alejandro

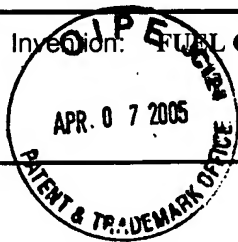
Customer No.

23469

Group Art Unit

1745

Invention: FUEL CELL HAVING OPTIMIZED PATTERN OF ELECTRIC RESISTANCE

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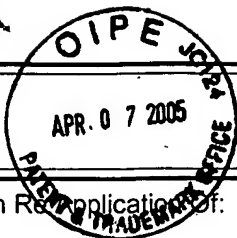
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**TRANSMITTAL LETTER  
(General - Patent Pending)**

Docket No.  
89190.072901/DP-304631

In Reply Application of: Keegan, et al.

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
10/032,606	October 19, 2001	R. Alejandro	23469	1745	8160

Title: **FUEL CELL HAVING OPTIMIZED PATTERN OF ELECTRIC RESISTANCE**

COMMISSIONER FOR PATENTS:

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Dated: April 4, 2005

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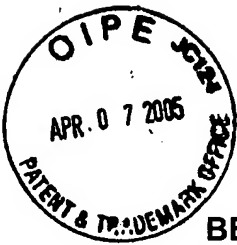
(Date)

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Margaret I. Hults

Typed or Printed Name of Person Mailing Correspondence

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IN THE UNITED STATES PATENT & TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant(s): Keegan et al.	)	Examiner: R. Alejandro
	)	
Serial No.: 10/032,606	)	Art Unit: 1745
	)	
Filed: October 19, 2001	)	
	)	
For: FUEL CELL HAVING	)	
OPTIMIZED PATTERN OF	)	
ELECTRIC RESISTANCE	)	
	)	

**REPLY BRIEF UNDER 37 C.F.R. § 41.41**

**Mail Stop Appeal Brief - Patents**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

This is a reply to the Examiner's Answer dated February 4, 2005  
responding to the Appeal Brief filed on October 29, 2004.

In responding to the Appellants arguments set forth in the Appellants Brief, the Examiner stated that the language in claim 2 fails to set forth a characteristic that results in a non-uniform electrical resistance over one of the anode, cathode, and electrode. See *Examiner's Answer*, pg. 8, lines 16-21. In giving the claim language its broadest reasonable interpretation, the Examiner contends that the language in claim 2 reads on any minute, minuscule, infinitesimal or microscopic variation of uniformity in a cathode, anode or electrolyte for any given point. See *id.* at pg. 8, lines 21-22; pg. 9, lines 1-2.

Appellants do not believe that the full scope of claim 2 has been considered and contend that the language of claim 2 does provide an arrangement of non-uniformity that is not taught or suggested by U.S. Patent Publication No. 2002/0098400 to Mieney et al. ("the Mieney reference"). In particular, claim 2 states that the resistance to the flow of electric current through the cell is non-uniform over a flow area of one of the anode, cathode, and electrolyte of the cell to regulate the flow of oxygen ions through any region of the cell in proportion to the partial pressure of hydrogen in the region. *See Claims Appendix*, Claim 2, lines 2-5, 13-14. *See Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305, 51 USPQ.2d 1161, 1165-66 (Fed. Cir. 1999) (citing *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 480-81 (C.C.P.A. 1951)) (stating that language in a preamble may be construed as a limitation when it is "necessary to give life, meaning, and vitality to the claim"). In other words, the electrical resistance over one of the anode, cathode, and electrolyte is non-uniform to regulate the flow of oxygen ions through any region of the cell in proportion to the partial pressure of hydrogen in the region.

Even if the electrical resistance in each of the fuel cell components in the Mieney reference may be non-uniform on a minute, minuscule, infinitesimal, or microscopic level as stated by the Examiner, there is nothing in the Mieney reference that discloses arranging the non-uniform electrical resistance to regulate the flow of oxygen ions through any region of the cell in proportion to the partial pressure of hydrogen in the region. The Mieney reference discloses nothing more than a conventional fuel cell that does not appear to prevent

excess  $O^{-2}$  to build-up in regions of low hydrogen concentration at the outlet portion of the anode, thereby allowing the CO to attack and oxidize the nickel in the anode. See *Specification*, pg. 3, lines 1-9.

By selectively varying the uniformity of the electrical resistance across one of the anode, cathode and electrolyte of a fuel cell in accordance with the present invention, excess oxygen migration and build-up will be suppressed in regions having low hydrogen concentration and correspondingly increases oxygen migration and build-up in regions having a surfeit of hydrogen. See *Specification*, pg. 4, lines 1-3. As a result, destructive oxidation of the fuel cell is prevented and electrical output is increased due to a greater percentage of hydrogen consumption. See *Specification*, pg. 4, lines 3-5.

Furthermore, the Examiner stated that the Appellants have taken the position that the anode, cathode and/or the electrolyte in the Mieney reference are inherently uniform because they are not inherently non-uniform. See *Examiner's Answer*, pg. 9, lines 16-20. Appellants would like to clarify their position. It is not the Appellants burden to show that the Mieney reference discloses uniform electrical resistance of one of the anode, cathode, and electrolyte. Instead, the Appellants have taken the position that the Examiner has failed to meet his burden of showing that the Mieney reference inherently discloses that the electrical resistance of one of the anode, cathode, and electrolyte is non-uniform.

In order "[t]o establish inherency, the extrinsic evidence 'must make clear that the missing [fuel cell property] is necessarily present in the thing described in

the reference, and that it would be so recognized by persons of ordinary skill.'" *In re Robertson*, 169 F.3d 743, 745, 49 USPQ.2d 1949, 1950-51 (Fed. Cir. 1999) (citing *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268, 20 USPQ.2d 1746, 1749 (Fed. Cir. 1991)). The Examiner has failed to present any external evidence to support his position that the the Mieney reference inherently discloses that the electrical resistance of one of the anode, cathode, and electrolyte is non-uniform. In fact, the Examiner admits that there is no "factual evidence demonstrating that Mieney's cathode, anode or electrolyte exhibit" uniform or non-uniform electrical resistance. *Examiner's Answer*, pg. 10, lines 15-17. While the Examiner may "suspect" that the fuel cell components in the Mieney reference can exhibit either uniform or non-uniform electrical resistance, any rejection based on the possibility that the Mieney reference discloses the claimed invention is not a sufficient basis to reject the claim based on inherency. See *Examiner's Answer*, pg. 10, lines 13-15; *Continental Can Co. USA v. Monsanto Co.*, 948 F.2d 1264, 1268, 20 USPQ.2d 1746, 1749 (Fed. Cir. 1991) (stating that inherency may not be established by probabilities or possibilities). "The mere fact that a certain thing may result from a given set of circumstances is not sufficient to establish inherency." *Continental*, 948 F.2d at 1268, 20 USPQ.2d at 1749.

Lastly, the Examiner appears to have improperly used the description of the present invention as a basis for rejecting claim 2 based on inherency. See *Examiner's Answer*, pg. 11, lines 4-22; pg. 12, lines 1-2. Specifically, the Examiner highlighted a portion of the Summary of the Invention section of the

Specification in stating that "the resistance is higher in areas of the cell having locally low levels of hydrogen than in areas having locally high levels of hydrogen . . . ." *Id.* at lines 4-6; see *Specification*, pg. 3, lines 17-22. Based on this statement, the Examiner contends that non-uniform electrical resistance of the fuel cell components in the Mieney reference is inherent because the hydrogen concentration level inherently varies from the anode inlet to the anode outlet due to hydrogen consumption along the active area of the anode. See *Examiner's Answer*, pg. 11, lines 7-11. As a result, the portion of the fuel cell near the inlet in the Mieney reference would have a low level of resistance, and the fuel cell components near the outlet would have a high level of electrical resistance (i.e., non-uniform electrical resistance).

While the hydrogen concentration level may vary from the anode inlet to the anode outlet in a fuel cell, there is nothing in the Mieney reference to indicate that the resistance is higher in areas of the cell having locally low levels of hydrogen than in areas having locally high levels of hydrogen. Recognizing that the Mieney reference does not inherently disclose this non-uniform electrical resistance characteristic, the Examiner used a portion of the Summary of the Invention and assumed that it is referring to an inherent function of the prior art. See *Specification*, pg. 3, lines 17-22. However, the statement that the "[r]esistance is higher in areas of the cell having locally low levels of hydrogen than in areas having locally high levels of hydrogen" is a description of the present invention, not an admission of an inherent function in the prior art. By making the electrical resistance through the fuel cell non-uniform to regulate the

flow of oxygen ions in proportion to the partial pressure of hydrogen, "destructive oxidation of the anode is prevented and a greater percentage of the hydrogen passed into the cell is consumed, thereby increasing electrical output."

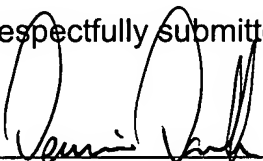
*Specification*, pg. 4, lines 3-5; *Claims Appendix*, claim 2. This advantage is not contemplated in the Mieney reference.

For these additional reasons, Appellants submit that the Mieney reference fails to teach or suggest every limitation disclosed in claim 2 and request that the rejection of claim 2 be withdrawn.

Appellants do not believe that a fee is due at this time. However, the Commissioner is hereby authorized to charge any fee that may have been overlooked to Deposit Account No. 10-0223.

Dated: 4/4/2005

Respectfully submitted,



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